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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/920,342	08/01/2001	Shi-Lung Lin	13761-7024	4134

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EXAMINER

SCHULTZ, JAMES

ART UNIT PAPER NUMBER

1635

DATE MAILED: 12/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/920,342

Applicant(s)

LIN ET AL

Examiner

J. D. Schultz, Ph.D.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 32,34-38,40-45,55,58-61 and 63-68 is/are pending in the application.
- 4a) Of the above claim(s) 37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 32,34-36,38,40-45,55,58-61 and 63-68 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Status of Application/Amendment/Claims

Applicant's response filed 29 September 2005 has been considered. Rejections and/or objections not reiterated from the previous office action mailed 28 June 2005 are hereby withdrawn. The following rejections and/or objections are either newly applied or are reiterated and are the only rejections and/or objections presently applied to the instant application.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The indicated allowability of claims 34-36, 38, and 40-45 is withdrawn in view of the newly discovered reference(s) to Alexeev et al. Rejections based on the newly cited reference(s) follow.

Election/Restrictions

This application contains claim 37 drawn to an invention nonelected with traverse in Paper No. 6 November 2003. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

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Claims of 32, 34, 35, 41-43, 55, 58, 59, and 64-66 are rejected under 35 U.S.C. 102(a) as being anticipated by Alexeev et al. (Nature Biotech. 2000, 18:43-47).

The claims of the instant invention are drawn to a method for inhibiting target gene expression comprising providing a composition comprising or consisting of an mRNA-cDNA hybrid such that the expression of said gene is inhibited. Later claims limit this invention by requiring that the targeted gene be in vivo, or wherein the gene is pathogenic, viral, mutated, or oncogenic in origin, or wherein said cell is eukaryotic, or is from a vertebrate, which may be a mouse.

Alexeev et al. teach the use of an RNA-DNA oligonucleotide that corrects a point mutation in a mouse. Thus, Alexeev et al. is considered to teach a method for inhibiting target gene expression comprising the use of an RNA-DNA hybrid, because expression of the mutated gene was inhibited. The method of Alexeev furthermore targets the gene in vivo. Although Alexeev does not teach that the RNA portion of the oligonucleotide is a full-length mRNA, a full-length mRNA is not considered to be required by the instant claim, because said claim does not recite that the mRNA must be full-length and also because the only examples taught in the instant specification that support the claimed method in vivo utilize a fragment of the coding sequence which itself is not a full-length mRNA. Thus, since the oligonucleotide of Alexeev et al. also uses a fragment derived from the coding sequence of the target gene, the method of Alexeev et al. is considered to be commensurate in scope with the teachings of the instant specification, and thus anticipates the invention of the claims listed above.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 32, 34, 36, 38, 40-45, 55, 58, 59, 61, and 63-68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alexeev et al. (cited above) as applied to claims 32, 34, 35, 41-43, 55, 58, 59, and 64-66 above, and further in view of Fire et al. (U. S. Patent Number 6,506,559), and Bennett et al. (U. S. Patent Number 6,066,500).

The claims of the instant invention are drawn to a method for inhibiting target gene expression comprising providing a composition comprising or consisting of an mRNA-cDNA hybrid such that the expression of said gene is inhibited. Later claims limit this invention by requiring that the targeted gene be in vivo, or wherein the gene is pathogenic, viral, mutated, or

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oncogenic in origin, or wherein said cell is prokaryotic, which may be bacterial, eukaryotic, or is from a vertebrate, which may be a mouse, chimpanzee, or human.

Alexeev et al. is relied upon as discussed above. The method of Alexeev does not disclose targeting a gene which is pathogenic, viral, or oncogenic in origin, or wherein the targeted cell is prokaryotic, or is from a chimpanzee, or human.

Fire et al. teach the use of double stranded RNAs in methods of targeting gene inhibition comprising administering to a cell set double stranded RNA. Fire et al. teaches that one of the two strands of the double stranded RNA is homologous to an mRNA from said cell. Fire et al. teaches that the targeted gene may be pathogenic, viral, or oncogenic in origin, and wherein the targeted cell is prokaryotic, or is from a chimpanzee, or human.

Bennett et al. teach the use of small oligonucleotide antisense inhibitors targeted against β -catenin in expression.

It would have been obvious to one of ordinary skill in the art to use the mRNA - cDNA hybrid of Alexeev et al. in the method of targeting specific gene expression using double stranded RNA as taught by Fire et al. One of ordinary skill in the art would have been motivated to substitute in the RNA - DNA hybrid of Alexeev et al. into the method of Fire, because the teachings of both authors are similar and overlap substantially in that both use double stranded nucleic acids to turn off unwanted gene expression and encourage the expression of the desired sequence. Furthermore, one of ordinary skill would have been motivated to substitute the RNA-DNA hybrid of Alexeev et al. in for the RNA-RNA hybrid of Fire et al. because the RNA-DNA hybrid of Alexeev et al. is more resistant to endogenous nuclease degradation, due to the presence of the DNA strand which is more resistant to said degradation. Finally, one of ordinary

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skill would have been motivated to combine the method of Fire with that of Alexeev for targeting pathogenic, viral, or oncogenic targets, since Fire et al. and Bennett et al. clearly contemplated targeting such targets.

One of ordinary skill in the art would have a reasonable expectation of success in making and using such oligonucleotides, since both Alexeev et al. and fire et al. teach making double stranded oligonucleotides, as well as methods of administering them to cells, including those in vivo, such that modulation of expression is achieved. Accordingly, the invention would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made.

Conclusion

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to (571) 272-0547.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to J. Douglas Schultz, Ph.D. whose telephone number is 571-272-0763. The examiner can normally be reached on 8:00-4:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang can be reached at 571-272-0811. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

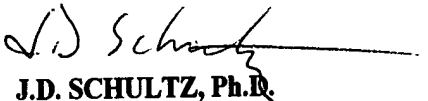
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JDS


J.D. SCHULTZ, Ph.D.
PATENT EXAMINER